

Study Guide

For use with pages 71–75

GOAL**Use the distributive property.****VOCABULARY**

Two numerical expressions that have the same value are called **equivalent numerical expressions**.

Two variable expressions that have the same value for all values of the variable(s) are called **equivalent variable expressions**.

EXAMPLE 1**Evaluating Numerical Expressions**

You are raising money for a field trip. The school matches your earnings. You earn \$125 selling sandwiches and \$95 at a car wash. Find the amount you have toward your field trip with the school's contribution.

Solution

Method 1: Find the amount you earned. Then multiply the result by 2, because your earnings are matched by the school.

$$\begin{aligned}\text{Total amount toward trip} &= 2(125 + 95) \\ &= 2(220) \\ &= 440\end{aligned}$$

Method 2: Find the amount earned and matched for selling sandwiches and the amount earned and matched for washing cars. Then add the amounts.

$$\begin{aligned}\text{Total amount toward trip} &= 2(125) + 2(95) \\ &= 250 + 190 \\ &= 440\end{aligned}$$

Answer: You have \$440 for your field trip.

Exercise for Example 1

1. You and a friend each spend \$5 on a movie ticket and \$4 on snacks. Write and evaluate two expressions that can be used to find the amount you both spent.

EXAMPLE 2**Using the Distributive Property**

You buy 5 shorts for \$15.02 each. Use the distributive property and mental math to find the total cost of the shorts.

Total cost = $5(15.02)$	Write expression for total cost.
$= 5(15 + 0.02)$	Rewrite 15.02 as $15 + 0.02$.
$= 5(15) + 5(0.02)$	Distributive property
$= 75 + 0.10 = 75.10$	Multiply, then add, using mental math.

Answer: The total cost of the shorts is \$75.10.

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EXAMPLE 3 Writing Equivalent Variable Expressions

Use the distributive property to write an equivalent variable expression.

- a. $15(3y - 4) = 15(3y) - 15(4)$ Distributive property
 $= 45y - 60$ Multiply.
- b. $-6(3x - 1) = -6(3x) - (-6)(1)$ Distributive property
 $= -18x - (-6)$ Multiply.
 $= -18x + 6$ Definition of subtraction
- c. $(2z + 5)(-11) = 2z(-11) + 5(-11)$ Distributive property
 $= -22z + (-55)$ Multiply.
 $= -22z - 55$ Definition of subtraction

Exercises for Examples 2 and 3

Evaluate the expression using the distributive property and mental math.

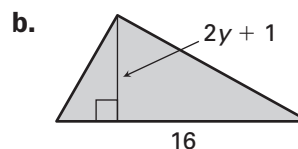
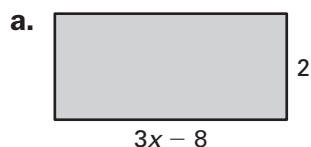
2. $5(197)$ 3. $35(11)$ 4. $4(13.04)$ 5. $7(8.98)$

Use the distributive property to write an equivalent variable expression.

6. $12(7x + 8)$ 7. $3(9y - 1)$ 8. $-5(9z + 6)$ 9. $-8(11m - 9)$

EXAMPLE 4 Finding Areas of Geometric Figures

Find the area of the rectangle or triangle.

**Solution**

- a. Use the formula for the area of a rectangle.

$$\begin{aligned}
 A &= \ell w \\
 &= (3x - 8)(2) \\
 &= 3x(2) - 8(2) \\
 &= (6x - 16) \text{ square units}
 \end{aligned}$$

- b. Use the formula for the area of a triangle.

$$\begin{aligned}
 A &= \frac{1}{2}bh = \frac{1}{2}(16)(2y + 1) \\
 &= 8(2y + 1) \\
 &= 8(2y) + 8(1) \\
 &= (16y + 8) \text{ square units}
 \end{aligned}$$

Exercises for Example 4

Find the area of the rectangle or triangle.

